

About DLTS signals from non-ideal back contacts and Cu(In,Ga)Se<sub>2</sub> thin-film solar cells

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Resume :

DLTS is commonly used to observe carrier emission from deep levels in the bandgap of semiconductors. The standard DLTS theory assumes the investigated device to be a (Schottky or p-n) diode with an ohmic back contact. It is well known, though, that thin film solar cell devices may deviate from this ideal structure. Hence, in addition to conventional signals due to carrier emission from electrically active defects in the structure, parasitic signals may arise in the DLTS spectra. Recently we have shown that a DLTS signal originating from an RC-like contact can be distinguished from an emission like defect by comparing signals with varying pulse amplitude. In a recent impedance spectroscopy study of Cu(In,Ga)Se<sub>2</sub> thin-film solar cells, the unusual properties of the N1 signal, also observed in DLTS, have been attributed to a non-ideal back contact [1]. In the present contribution we test whether the DLTS signals labelled as N1 follow the behavior we predicted for a back contact barrier. [1] T. Eisenbarth et al. J. Appl. Phys. 107 (2010), 034509